The PACE Framework

Population and Health Outcomes		
Outcome	Operational Definition and Measurable Sub-Domains	Examples of Outcome Measures
Care coordination	Policies and practices that create coherent and timely client-centered care both within and across care settings and over time. Examples include: • Communication between team members • Timing and support of transition between care (e.g., acute care to in-patient rehab; early intervention to early childhood) • Link to community resources	• *Assessment of Interprofessional Team Collaboration Scale* (Orchard et al., 2012) • *Interprofessionalism Assessment* (Frost et al., 2019) • *Interdisciplinary Team Process and Performance Survey* (Temkin-Greener et al., 2004) • Length of time for transition care • Survey of client perceptions of quality and timeliness of care coordination
Health promotion	"Process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental, and social well-being, an individual or group must be able to identify and realize aspirations, to satisfy needs, and to change or cope with the environment" (World Health Organization, 1986). Examples include: • Population health promotion, focused on communities and factors that influence their health • Group health promotion, focused on health and engagement (e.g., engagement in leisure among older adults, reduction in bullying at schools) • Individual health promotion	*Groups & Populations* • Healthy People 2030 Leading Health Indicators (U.S. Department of Health and Human Services, n.d.) • Population measurement: Patient-Reported Outcomes Measurement Information System PROMIS®, www.nihpromis.org (Northwestern University, 2021a) • Reduction in health disparities • Promotion of healthy living practices *Individuals* • Individuals • Healthcare utilization • Measures of health status • Changes in modifiable health risk factors • Frequency of participation in health promotion activities
Occupational performance	"Accomplishment of the selected occupation resulting from the dynamic transaction among the client, their contexts, and the occupation" (AOTA, 2020d, p. 8).	• *Canadian Occupational Performance Measure* (Law et al., 1990) • *Montreal Cognitive Assessment* (Nasreddine et al., 2005)

	Examples include:
	• Occupational performance
	  ○ Activities of daily living (ADLs)
	  ○ Instrumental activities of daily living (IADLs)
	  ○ Health management
	  ○ Rest and sleep
	  ○ Education
	  ○ Work
	  ○ Play & leisure
	  ○ Social participation
	• Performance patterns
	• Performance skills
	• Client factors
		• NIH Toolbox for Assessment of Neurological and Behavioral Function (Northwestern University, 2021b)
		• *Occupational Circumstances Assessment Interview and Rating Scale* (Forsyth et al., 2005)
		• *Occupational Performance History Interview* (Kielhofner et al., 2001)
		• *Occupational Self-Assessment* (Baron et al., 2002)
		• *Pediatric Evaluation of Disability Inventory – Computer Adaptive Testing* (Dumas et al., 2015)
		• *Sensory Processing Measure* (Parham et al., 2007)
		• *Sensory Profile-2* (SP-2; Dunn, 2014)

Participation	"Involvement in a life situation" (World Health Organization, 2001, p. 10). Examples include: • Client satisfaction, enjoyment, and/or frequency with current engagement in meaningful occupations and everyday activities	• *Assessment of Preschool Children's Participation* (Law et al., 2012) • *Canadian Occupational Performance Measure* https://www.thecopm.ca/ (Law et al., 1990) • *Community Participation Indicators* (Heinemann, 2010) • *Goal Attainment Scaling* (Kiresuk & Sherman, 1968) • *School Function Assessment* • *The Child and Adolescent Scale of Participation* (Bedell, 2011)
Prevention	"Education or health promotion efforts designed to identify, reduce, or prevent the onset and decrease the incidence of unhealthy conditions, risk factors, diseases, or injuries" (American Occupational Therapy Association, 2020c, p. 81). Examples include: • Considerations of how occupational therapy delivered through telehealth influences health and developmental outcomes, possibly decreasing need for more intensive care later in life	• Safe at Home Checklist (AOTA, n.d.-c) Analysis of data related to: • # of injuries, rate of absenteeism related to injury • # of falls post implementation of fall prevention programming • # of hospitalizations post prevention-focused OT intervention • Developmental and academic outcomes among children • Home safety and accessibility for fall prevention among older adults

	• Prevention-focused program process measure	
Quality of life	"Dynamic appraisal of the client's life satisfaction (perceptions of progress toward goals), hope (real or perceived belief that one can move toward a goal through selected pathways), self-concept (composite of beliefs and feelings about oneself), health and functioning (e.g., health status, self-care capabilities), and socioeconomic factors (e.g., vocation, education, income; adapted from Radomski, 1995)" (AOTA, 2020d, p. 66). Examples include: • Nutrition • Stress • Quality of education • Economic conditions • Social engagement • Leisure/recreation participation	• *Global Quality of Life Scale* (Hyland & Sodergren, 1996) • *Health-Related Quality of Life Questionnaire* (CDC, 2000) • *McGill Quality of Life Questionnaire — Expanded* (Cohen et al., 2019) • *Health-related QOL PedsQL* (Varni et al., 1999) • *Short Form 36 Questionnaire* (Rand, n.d.) • *The Quality of Life Scale* (Flanagan, 1978) • *World Health Organization Quality of Life Instrument* (WHO, 2004)
Role competence	"Ability to effectively meet the demands of the roles in which one engages" (AOTA, 2020d, p. 67). Examples include: • Self-efficacy, satisfaction, prioritization, and motivation related to life roles	• *Parenting Sense of Competence Scale* (Ohan et al., 2000) • *Perceived Maternal Parenting Self-Efficacy Scale* (Barnes & Adamson-Macedo, 2007) • *Role Checklist V3* (Scott, 2019) • Self-Management Self-Test (Wehmeyer et al., 2019) •
Self-Advocacy	"Advocacy for oneself, including making one's own decisions about life, learning how to obtain information to gain an understanding about issues of personal interest or importance, developing a network of support, knowing one's rights and responsibilities, reaching out to others when in need of assistance, and learning about self-determination." (AOTA, 2020d, p.83). Examples include: • Behavioral autonomy • Self-regulated behavior	• *Daily Living Self-Efficacy Scale* (Maujean et al., 2014) • *General Self-Efficacy Scale (GSE; Schwarzer & Jerusalem, 1995)* • *Falls Self-Efficacy Scale* (FES; Tinetti et al., 1990) • *Patient Activation Measure* (Hibbard et al., 2004) • *The Arc's Self-Determination Scale* (Wehmeyer, 1999) • *The Arc's Self-Determination Scale-Adolescent Version* (Wehmeyer & Kelchner, 1995)

	• Psychological empowerment • Self-realization	
Well-being	"Contentment with one's health, self-esteem, sense of belonging, security, and opportunities for self-determination, meaning, roles, and helping others" (AOTA, 2020d, p. 67). "A general term encompassing the total universe of human life domains, including physical, mental, and social aspects, that make up what can be called a 'good life'" (World Health Organization, 2006, p. 211). Examples include: • Sense of self-efficacy, satisfaction, stress, and burden associated with caregiving	*Caregiver* • Life Balance Inventory (Matuska, 2012) • WHO-Five Well-Being Index (WHO-5), WHO-Ten Well-Being Index (WHO-10) (World Health Organization, 1998) • Zarit Burden Interview (Zarit et al., 1980) *Client* • *Life Balance Inventory* (Matuska, 2012) • OECD Guidelines on Measuring Subjective Well-being • *Student Life Satisfaction Scale* (Huebner, 1991) • NIH Toolbox® (Northwestern University, 2021b) • Subjective well-being measures
Access for All Clients		
Diversity, equity and inclusion [This topic deserves much more extensive content that is beyond the scope of this paper.]	In accord with AOTA's commitment to diversity, equity, and inclusion (AOTA, 2020b) and the AOTA (n.d.-a) Vision 2025, telehealth research, practice, and policy should reflect diversity in race, ethnicity, gender, age, socio-economic status, geography, and other demographics; promote occupational justice; and be client-centered.	Outcome measures can be extracted from the following guides: • Diversity, Equity and Inclusion in Occupational Therapy, Resources and the DEI Tool Kit (AOTA, n.d.-b) • Equity & Inclusion Lens Guide (Non-Profit Association of Oregon, 2018) • Ford Foundation Disability Inclusion Toolkit (Ford Foundation, n.d.) • AOTA's Guide to Acknowledging the Impact of Discrimination, Stigma, and Implicit Bias on Provision of Services (AOTA, 2020a)
Access to technology and internet	The extent to which technology and available internet data is sufficiently available and affordable to individuals and communities. Examples include: • Broadband availability and speed in communities	• Amount of high-speed data available per month, per family or individual • County average cellular and fixed wireless download speeds (see www.NACO.org) • Number of internet subscribers in a community or neighborhood (see www.Brookings.edu) • Number of devices per household • Point of access for internet use (e.g., home, community, school)

	• Individuals' access or ownership of smartphones, tablets, laptops or desktop computers. • Cost of access (i.e., laptops, smartphone, internet, data)	
Availability and usability of translators	The extent to which an organization supports translation services for clients to access services. Examples include: • The range and number of translation services offered at various entry points into occupational therapy treatment as well as client reported satisfaction and acceptability of translation services.	• Satisfaction surveys with ways for clients to express ways to improve language services • The percent of clients/patients who have been screened for their preferred spoken language • The percent of clients receiving initial assessment and intervention sessions from assessed and trained interpreters or from bilingual providers assessed for language proficiency (see Regenstein, 2007). • Volume of interpreter encounters within an institution, agency, or school • Wait times for interpreter availability
Availability of specialists	The extent to which telehealth extends the availability of providers with specializations and/or certifications. Examples include: • Number, availability, and collaboration among OT practitioners with specializations and/or certifications	• Client wait times to access providers with specialty certifications • Number of sessions with specialty providers • Number of sessions with collaboration between specialty providers and client's original practitioner • Percent of telehealth providers with specialty certifications within an agency, hospital, or school
Digital health literacy	The degree to which individuals have the ability to find, understand, and use information and services to inform health-related decisions and actions for themselves and others. Examples include: • Finding and consuming digital content • Creating digital content • Communicating and/or sharing digital content • Evaluating quality and relevance of digital content	• *Digital Health Literacy Instrument* (van der Vaart & Drossaert, 2017) • *eHealth Literacy Assessment Toolkit* (Karnoe et al., 2018) • *eHealth Literacy Questionnaire* (eHLQ; Kayser et al., 2018) • *eHealth Literacy Scale* (eHEALS; Norman & Skinner, 2006) • Tracking the level of support that individuals, including children, require to log on and navigate telehealth sessions

Integration and use of clients' everyday materials	The ways in which assessment and intervention sessions use clients' readily available materials in their natural contexts. Examples include: • Using clients' and families' materials for assessment and intervention • Any specialized materials and/or equipment that clients / families are asked to purchase to engage in assessment / intervention	• Any documentation to prepare clients and/or families about expectations regarding upcoming sessions • Documentation about what materials / intervention activities in which clients and families engaged • Documentation that would reflect any "specialized" materials and/or materials that clients/families would have to purchase to complete the intervention session
Organizational digital health literacy	The degree to which organizations equitably enable individuals to find, understand, and use information and services to inform health-related decisions and actions for themselves and others (CDC, 2021). Examples include: • Organizational structure, policy, and leadership supports for telehealth software that supports clear client-OT practitioner communication, and is easily navigated by OT practitioners and clients.	• Availability of available and validated assessment measures that are compatible with numerous telehealth platforms • Ease of integration of assessment measures, documentation, and client communication within telehealth software • Leadership support for practitioner and client training to access telehealth
Technology usability	The extent to which available technology is appropriate for telehealth access, including evaluation and intervention sessions. Examples include: • Effectiveness, efficacy, and satisfaction with the device and internet quality of accessing telehealth sessions.	• Amount of time to log on to telehealth sessions • *Computer Proficiency Questionnaire* (Boot et al., 2015) • *Mobile Device Proficiency Questionnaire* (Roque & Boot, 2018) • Number of internet disruptions / slow internet miscommunications during a session • The amount of client assistance needed to schedule and log on to a session • The extent to which the device / internet speed allows for effective communication between the client and practitioner
Scheduling ease and convenience	Client reports of scheduling ease as convenient and fitting into their daily lives. Examples include: • Client reported ease and satisfaction with setting up and attending telehealth sessions.	• Availability of OT practitioners on evenings and weekends to match clients' schedules • Client satisfaction survey with questions about scheduling convenience and availability of appointments
Cost and Cost Effectiveness		

Client costs and cost savings	The costs and cost savings associated with accessing and attending telehealth sessions; clients may save expenses due to convenience of telehealth and/or incur costs if any additional technology or data is necessary to access telehealth sessions.
	
	Examples include:
	• Travel considerations related to time and distance may be dependent on community setting (e.g., rural vs. urban) and client reported method of transportation.
		Costs
		• Costs incurred by clients, including sufficient internet connectivity and technology devices to access appointments
		
		Savings
		• Cost savings related to client burden reduction including:
		  ○ travel expenses (gas, food)
		  ○ time off work for travel to appointments
		  ○ missed work or school days
		  ○ childcare expenses associated with appointment
		  ○ public transportation costs
		  ○ fuel costs and costs associated with parking personal vehicle, if applicable
		  ○ attendance at community support activities
		• Calculated mileage/travel distance (Note: Distance may be appropriate to measure for suburban and/or rural samples, while for urban samples, measurement strategies may be based in time, where public transportation or traffic are considered.)
		• Clients' report of travel distance and time with their specific method of transportation (e.g., car travel may be faster than public transit travel)

Practitioner costs and cost savings	The costs and cost savings among practitioners that result from telehealth. Examples include: • Saved expenses due travel time and costs, and/or incurred costs if software, technology, or additional data is necessary to conduct telehealth sessions.	• Costs associated with telehealth software, multiple state licenses, internet and technology (e.g., hardware, software, peripherals) • Miles from home to clinic or hospital setting • Travel distance /time for therapy practitioner(s) to travel (between home, hospital, clinic(s), school(s), clients' homes, etc.)
Relation of service utilization to long term outcomes	The degree to which costs of occupational therapy delivered via telehealth are associated with long term health and/or developmental outcomes across clients and settings. Examples include:	• Analyses using an incremental cost-effectiveness ratio (ICER) to determine if clients' functional gains over time differ by service delivery model (e.g., in-person, hybrid, telehealth) • Analyses that compare groups' outcomes among those that receive occupational therapy by different service delivery models (e.g., in-person, hybrid, telehealth)

	• Expenses that would likely have occurred if service was not provided (e.g., rehospitalization, development of pressure ulcer, etc.)	• Emergency department (ED) visit avoidance in real time and/or future • Healthcare utilization, compare to a normative database • Comparison of adopters to non-adopters to long term health outcomes (e.g., cohort design)
Service provision and utilization	The extent to which occupational therapy services are offered, available, and attended by clients across settings and communities.	• Rate of attendance, which includes number of cancelled appointments and/or no shows • The number, frequency, and length of sessions that were utilized to achieve a specific goal or gain in function • The ratio of number, frequency, and length of sessions that are attended by clients. • Total number, frequency, and length of time services that are recommended
Experiences of Clients and OT Practitioners		
	The extent to which telehealth sessions occur within clients' authentic contexts and address clients' everyday activities.	• Assessment results that reflect clients' performance in their everyday environments • Documentation about how everyday routines look for clients in their natural context • Documentation of locations in which sessions occur • Documentation of locations of both clients and OT practitioner • Evidence of ecological validity of assessment approaches • Potential measures of generalization of how clients / caregivers can use intervention strategies used in everyday environments
Caregiver/ Trusted supporter acceptability and satisfaction	The acceptability and perceived quality of the service delivery mechanism from the perspective of the caregiver for younger clients and/or trusted supporter for older clients.	• *Canadian Occupational Performance Measure* (COPM; Law et al., 1990) • *Telehealth Acceptability and Satisfaction Questionnaire* (e.g., Little et al., 2018; Vismara et al., 2012) • *Washing Co. Family Caregiver Satisfaction Survey* (Washington Co. Family Caregiver Support Program, n.d.)
Client acceptability and satisfaction	The perceived acceptability, value, and client attributed outcomes of telehealth delivered occupational therapy services.	• *Canadian Occupational Performance Measure* (COPM; Law et al., 1990) • *Telehealth Acceptability and Satisfaction Questionnaire* (adapted for clients' self-report) (e.g., Little et al., 2018; Vismara et al., 2012)

		• Client satisfaction influenced by perceived benefits of telehealth (e.g., saved workdays or school days, reduced travel, time, and costs associated with receiving care through telehealth) • Surveys that incorporate clients' reports of functional gain as a result of telehealth
Inclusion of care supporters (caregiver/family/ other)	The extent to which clients' care supporters actively participate in and are included in the occupational therapy process (i.e., assessment, intervention, re-evaluation).	• Documentation of care supporter's engagement in the session • The % of time the care supporter participated in the session • The % of time the practitioner engaged with the care supporter
Practitioner acceptability and satisfaction	The extent to which OT practitioners perceive that telehealth promotes wellness, reduces burnout, and is an effective mechanism to deliver assessment and interventions that meet clients' needs and achieve evidence-based practice standards.	• *Maslach Burnout Inventory* (Maslach & Jackson, 1981) • *Oldenburg Burnout Inventory* (Demerouti et al., 2001) • *Professional Quality of Life Measure* (Stamm, 2009) • *Stanford Professional Fulfillment Index* (Trockel et al., 2018) • *Telehealth Acceptability and Satisfaction Questionnaire* (adapted for practitioners' responses) (e.g., Little et al., 2018; Vismara et al., 2012) • *WHO-5 Well-Being Index* (WHO, 1998)

Reference: Little, L. M., Pickett, K. A., Proffitt, R., & Cason, J. (2021). Keeping PACE With 21st Century Healthcare: A Framework for Telehealth Research, Practice, and Program Evaluation in Occupational Therapy. *International Journal of Telerehabilitation*, *13*(1). https://doi.org/10.5195/ijt.2021.6379